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SPECIFICATION COVER SHEET

Client: Gowanus Canal Remedial Design Group **Project:** Gowanus Canal – 4th St Turning Basin Pilot Study – Dredging and Capping **Project #:** HPH106A

SPECIFICATION SECTION: 31 23 00 **TITLE:** UPLAND EXCAVATION AND FILL

SPECIFICATION PREPARED BY: (Specification Preparer, SP)	Signature	JFB Beech for	19 May 2017
	Name	Erik Miller	Date
SCOPE AND FORMAT CHECKED BY: (Scope and Format Checker, SFC)	Signature	Jessie Fears	5/19/17
	Name	Jessie Fears	Date
DETAILED REQUIREMENTS CHECKED BY: (Detailed Requirements Checker, DRC)	Signature	DNicholas	5/19/17
	Name	Darrell Nicholas	Date
APPROVED BY: (Specification Approver, SA)	Signature	J. F. Beech	19 May 2017
	Name	J.F. Beech	Date

Record of Revision (Number and initial all revisions)

Rev. No.	Reason	Date	By	Checked	Approval
0	TB4 Pilot Study Design – Issued for Bid	05/19/17	EM	JF	JFB

SECTION 31 23 00

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Name Erik Miller Date

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Name Jessie Fears Date

DETAILED REQUIREMENTS CHECKED BY:
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Name Darrell Nicholas Date

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(Specification Approver, SA)

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SECTION 31 23 00

UPLAND EXCAVATION AND FILL

PART 1 GENERAL

1.01 SUMMARY

A. Work in this Section covers earthwork-related activities to be conducted at the upland Staging Site to facilitate (i) storage of supplies and equipment and (ii) installation of the dredge water treatment system. Work activities include: installation of construction safety fencing and barriers around excavation areas, installation of gravel road, excavation and fill, subgrade preparation, compaction, and grading.

1.02 RELATED SECTIONS, PLANS, AND DOCUMENTS

A. Section 01 33 00 Submittals

B. Section 01 35 29 Health, Safety, and Emergency Response Requirements

C. Section 01 41 00 Regulatory Requirements

D. Section 01 57 13 Temporary Erosion and Sediment Control

E. Section 01 57 19 Temporary Environmental Controls

F. Section 02 51 19 Dredged Sediment and Waste Management

G. Section 44 08 40 Dredge Water Treatment

H. Contract Documents

1.03 REFERENCES

A. Latest version of American Society for Testing and Materials (ASTM) Standards:

1. ASTM D422 Standard Test Method for Particle-Size Analysis of Soils.

2. ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft^3 (600 kN-m/m^3)).

3. ASTM D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.

4. ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

5. ASTM D4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

B. New York State Department of Environmental Conservation (NYSDEC) Regulations, Division of Environmental Remediation (DER)-10, Appendix 5: *Allowable Constituent Levels for Imported Fill or Soil*. (Provided as Attachment K.4).

C. New York State Department of Transportation (NYSDOT). *Standard Specifications,* Construction and Materials (USC), latest version.

D. NYSDOT Compilation. *Manual for Uniform Recordkeeping (MURK) Part 1B Construction Inspection Manual (CIM)*, latest version.

1.04 SUBMITTALS

A. The Contractor shall submit the following to the Owner's Representative in accordance with Section 01 33 00:

1. Proposed sources of offsite fill materials;

2. Material Property Testing submittals, including the following information:

a. Name and address of the Material Property Testing Laboratory proposed for use during the project;

b. Certificate documenting American Association of State Highway and Transportation Officials (AASHTO) accreditation or the Material Property Testing Laboratory;

c. Results of material property testing for proposed fill materials that meet the sampling requirements listed in this Section. Each composite sample shall be tested for the following material properties:

i. Particle size distribution by ASTM D422;

ii. Atterberg limits by ASTM D4318;

iii. USCS Classification by ASTM D2487;

iv. Natural water content by ASTM D2216; and

v. Compaction curve under standard Proctor effort by ASTM D698.

3. Analytical Chemistry Testing submittals, including the following information:

a. Results of analytical chemistry testing for proposed fill materials that meet the sampling requirements listed in this Section. The Contractor shall send composite soil samples to an Analytical Chemistry Testing Laboratory selected by the Owner's Representative. Each composite sample for each material shall be tested for the compounds in Appendix 5 of NYSDEC DER-10 (Attachment K.4). Commercial cleanup objectives apply.

4. Test results from compaction QC testing described in this Section;

5. Graded aggregate base material (GAB) submittals, including the following information:

a. Material test results or written certification from the supplier that the GAB conforms to the requirements of this Section.

1.05 HEALTH AND SAFETY REQUIREMENTS

A. The Contractor shall comply with environmental health and safety/training requirements in accordance with the approved Health and Safety Plan and Section 01 35 29.

PART 2 PRODUCTS

2.01 MATERIALS

A. Structural fill and backfill materials shall be free of debris, foreign objects, large rock fragments, demolition debris, organics, and deleterious materials. Visible particles shall be a maximum dimension of 2 inches for maximum 8 inch thick loose lifts, and 1 inch for maximum 4 inch thick loose lifts. Material for compacted fill shall conform to GW, GP, GM, GC, SW, SP, SM or SC according to the United Soil Classification System (per ASTM D2487).

B. Furnish GAB conforming to the requirements of New York State Department of Transportation Standard Specification (USC) 733.0401 – *Subbase Course, Type I*, or 733.0402 – *Subbase Course, Type 2*.

C. Furnish geotextile separator for roads as shown on the Construction Drawings.

D. Contractor shall obtain construction water in accordance with permit requirements listed in Section 01 41 00 for moisture conditioning of fill and for dust control.

E. Contractor shall furnish orange HDPE construction safety fence, 4 feet in height, opening size approximately 4 inches x 1 inch, minimum tensile strength of 2,000 pounds per foot of width. Posts shall be T-shaped (T-post), 1½-inch x 1½-inch, minimum $^{3}/_{16}$-inch thick x 5 feet long, and made of steel, or as otherwise authorized by the Owner's Representative. Protective caps shall be placed on the tops of all T-posts.

F. Furnish materials for chain-link fence and gate repairs to match materials currently installed at the site.

G. Granular backfill to be used between existing bulkhead and bulkhead support. shall meet the grain size gradation requirements for NYS Specification #2 Coarse Aggregate stone per ASTM C136. Granular backfill shall be clean, free of deleterious material, durable, and of uniform quality.

2.02 EQUIPMENT

A. Contractor shall furnish equipment to perform earthwork in accordance with this Section.

B. Contractor shall furnish hand compaction equipment, such as walk-behind pad-foot compactors, hand tampers, or vibratory plate compactors, for compaction in areas inaccessible to large compaction equipment.

C. Contractor shall furnish water tank trucks or water wagons, water storage tanks, pressure distributors, or other equipment designed to apply water uniformly and in controlled quantities at variable surface widths in order to provide the required in-place moisture content and to prevent drying of soil surfaces in accordance with this Section.

PART 3 EXECUTION

3.01 GENERAL

A. No imported materials shall be delivered to the Site before the required material property and analytical chemistry testing for that batch has been provided to the Owner's Representative and written approval received from the Owner's Representative. Unapproved material shall be removed from the Site and disposed of at the Contractor's expense.

B. Verify the accuracy of the existing conditions shown on the Construction Drawings prior to beginning the Work described in this Section.

C. Drawings may not show all subsurface utilities. Contractor shall locate all subsurface utilities before initiating work. Subsurface utilities damaged by Contractor shall be repaired by Contractor to the satisfaction of the Owner's Representative at no additional cost to the Owner.

D. Immediately notify the Owner's Representative of deviations from the existing conditions shown on the Construction Drawings verbally and in writing in accordance with the Contract Documents.

E. Prior to performing Work described in this Section, install and maintain erosion and sediment controls in accordance with Section 01 57 13 and the Sediment and Erosion Control Plan shown on the Construction Drawings.

F. Manage earthwork material stockpiles as specified in this Section.

G. Implement environmental controls and dust control in accordance with Section 01 57 19.

3.02 SAMPLING

A. The Contractor shall collect and transport samples of imported fill in compliance with the Quality Assurance Project Plan (QAPP) described in Section 02 51 19. The Owner's Representative reserves the right to observe sampling and testing of the materials. The Contractor shall provide at least a 24-hour notice of a sampling event to the Owner's Representative.

B. Analytical chemistry test results for fill materials shall be below the Commercial cleanup objective concentrations provided in Appendix 5 of NYSDEC DER-10 (Attachment K.4). Failure of a single compound test result shall mean that the entire material batch will be rejected unless specifically accepted on a test-by-test basis in writing by the Owner's Representative.

C. The Contractor shall obtain representative composite samples of each specific material type from each specific material source. The total composite sample mass shall be at least the minimum size required to conduct all of the required material property and analytical chemistry tests for that material type. Each of the individual samples will be obtained from within the boundaries of the material mass that the composite sample represents.

D. The Contractor shall collect one (1) CQC composite sample for every 250 cubic yard (cy) batch of imported fill type from each specific fill source for the first 500 cy and one sample per each additional 500 cy or fraction thereof. E.

E The Contractor shall conduct compaction testing in accordance with frequencies specified in the NYSDOT compilation of the Manual for Uniform Recordkeeping (MURK) Part 1B Construction Inspection Manual (CIM), Section 203 Excavation and Embankment.

3.03 SITE PREPARATION

A. Install construction safety fence in accordance with the Construction Drawings and this Section. Relocate construction safety fence as required to support construction activities. Install signs and barricades around trenches and excavated areas in accordance with the Site Health and Safety Plan and Section 01 35 29.

B. Maintain and repair construction safety fence and chain-link fence and gates for the duration of the Contract Work. Repair chain-link fence and gates to match materials currently installed at the site, if damage occurs during the Work.

C. For excavations within 3 feet of existing subsurface structures or utilities, excavate by hand or other means and methods approved by the Owner's Representative, and use shoring or other means, methods, and techniques as approved by the Owner's Representative. Protect structures and utilities during earthwork activities by means, methods, and techniques approved by the Owner's Representative.

3.04 EXCAVATION

A. Blasting, including use of explosives or explosive devices, shall not be permitted.

B. Minimize sloughing and caving of excavations. In areas of excavations that cave or slough, over-excavate and backfill in accordance with this Section.

3.05 EXCAVATION DEWATERING

A. Manage groundwater, surface water runoff, and surface water run-on in excavations and trenches in accordance with the requirements of this Section.

B. Collect water that accumulates in excavations or trenches with a suitable sump pump and transport to water treatment plant or a location approved by the Owner's Representative.

C. Verify that collected water does not have oil sheen prior to pumping using a method such as Kolor Kut® gasoline gauging paste applied onto a steel tape. If sheen is present notify the Owner's Representative prior to pumping. If oil is present, collect the sheen with an oil absorbent cloth or other means, methods, and techniques approved by the Owner's Representative until no oil sheen is present based on testing by a method such as Kolor Kut® gasoline gauging paste.

D. Prevent surface water run-on from adjacent areas from entering excavations and trenches by installing a temporary diversion berm, diversion channel, or other surface water management feature approved by the Owner's Representative.

3.06 STOCKPILING

A. Stockpile materials from excavation and trenching activities at locations approved by the Owner's Representative. Deleterious materials and unsuitable soil from the above-mentioned activities shall be placed in separate stockpiles for disposal.

B. The Contractor shall maintain an approximately 5 cubic yard stockpile of GAB at the site to repair the road, as necessary.

3.07 SUBGRADE PREPARATION

A. Subgrade shall be free of debris, foreign objects, organics, and other deleterious materials.

B. In the event saturated subgrade is encountered, construct localized sumps to facilitate removal of water. Manage removed water in accordance with this Section and Sections 02 51 19 and 44 08 40.

C. Where fill is to be placed on existing ground or subgrade, prepare the existing ground or subgrade by scarifying to a depth of approximately 2 inches.

D. In areas where unsuitable soils exhibiting pumping, deformation or rutting are encountered, remove and replace the soils to a minimum depth of 6 inches. Remove additional depth of unsuitable subgrade material if necessary to obtain a suitable soil surface for fill placement. For a soil surface exhibiting pumping, deformation (e.g., more than 2 inches under vehicle or equipment traffic) or developing ruts more than 2 inches deep, remove soil to a minimum depth of 6 inches and replace or dry in place by discing or by other appropriate means, methods, and techniques. Removal of additional unsuitable soils shall be approved by the Owner's Representative. In areas from which soil has been removed, replace with fill in accordance with this Section.

E. In excavations or other areas where water accumulates, implement measures to remove the water in accordance with this Section. Maintain the subgrade free of standing water and in a firm condition which conforms to the requirements of this Section. Maintain dewatered areas in this condition until overlying construction is complete.

F. In areas where suitable subgrade conditions are not practical to achieve, the Contractor may propose bridging the non-conforming subgrade area or adding soil amendments such as Portland cement or other means and methods approved by the Owner's Representative. Bridging or amending non-conforming subgrade shall be performed only in areas and using methods approved in writing by the Owner's Representative.

3.08 FILL

A. Place fill material that conforms to the material requirements of this Section.

B. Place fill material on surfaces that are free of debris, branches, vegetation, mud, ice, and other deleterious materials.

C. Place fill material in loose lifts with a maximum thickness of 8 inches. In areas where compaction is to be performed using hand-operated equipment, place fill material in loose lifts with a maximum thickness of 4 inches.

D. Continuously remove visible rock particles with a maximum dimension larger than one-quarter of the loose lift thickness.

E. Place fill in horizontal lifts, benching into embankments as necessary to maintain the full lift thickness.

F. Prior to placing a lift of fill material over a previously compacted lift, thoroughly scarify the previous lift to a depth of approximately 2 inches by discing, raking, or tracking. Moisture condition the preceding lift in accordance with this Section if its surface moisture content is not within the range of acceptable moisture contents specified in this Section.

G. In areas where fill is placed to bring site to grade or to promote drainage, the Contractor shall compact placed material to a firm and unyielding condition. The Contractor shall proof roll areas of fill with the heaviest equipment available at the Site. Areas that exhibit pumping or excessive rutting (greater than 2 inches), as identified by the Owner's Representative, shall be removed and reworked to achieve a firm and unyielding condition.

H. Fill placed for embankments or as part of structures, filling of trenches, or backfill for critical structures shall be compacted to 95 percent of the maximum dry density, and within plus or minus 3 percent of the optimum moisture content, as measured in ASTM 698.

I. Moisture-condition the fill material to achieve the compaction requirements specified in this Section. During wetting or drying, regularly disc, rake, or otherwise mix the material to thoroughly blend the moisture throughout the lift.

J. Do not place frozen fill or fill on a frozen surface.

K. Do not compact fill material at temperatures below 32°F unless authorized verbally or in writing by the Owner's Representative.

L. Do not place fill during periods of precipitation. Placement may occur during periods of misting or drizzle, but only if authorized verbally or in writing by the Owner's Representative.

M. Grade and seal the uppermost lift of fill placement to a relatively smooth surface that is free draining and does not promote ponding.

3.09 GRADED AGGREGATE BASE MATERIAL INSTALLATION

A. Install geotextile separator over the prepared subgrade as described in this Section and as shown on the Construction Drawings.

B. Anchor or weight geotextile separator with sandbags, or by other means, methods, and techniques as approved by the Owner's Representative, to prevent damage and displacement from wind.

C. Overlap geotextile separator for road areas a minimum of 12 inches.

D. Do not operate equipment directly on the geotextile separator.

E. Do not damage or displace the geotextile separator by pushing or shoving material across the geotextile separator. Place the GAB on top of the geotextile separator by dumping the material on the preceding lift and placing in a manner that cascades the material onto the geotextile separator.

F. Construct the GAB layer on subgrade approved by the Owner's Representative in accordance with this Section to the thickness, grades, and limits shown on the Construction Drawings.

G. GAB shall be free of debris, foreign objects, organics, and other deleterious materials.

H. Spread and place the GAB in accordance with fill placement requirements described in this Section and as shown on the Construction Drawings.

I. Compact the GAB by tracking with a dozer, smooth drum roller, or other equipment approved by the Owner's Representative to achieve a firm and unyielding surface.

J. The Contractor shall maintain the GAB for the duration of the Contract.

3.10 CONSTRUCTION QUALITY REQUIREMENTS

A. Construction Quality Control (CQC) shall be performed in accordance with the Contract Documents.

B. If CQC tests indicate that any portion of the fill or subgrade do not conform to the requirements of this Section, the Owner's Representative will delineate the extent of the non-conforming area. At no additional cost to Owner, the Contractor shall rework the nonconforming area until it conforms to the requirements of this Section. If materials (e.g., fill, subgrade, GAB) do not conform to this specification, then Contractor shall remove all nonconforming material and replace it with conforming material at no additional cost to the Owner.

[END OF SECTION]